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PATENT AND TECHNICAL TRANSLATION

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DECLARATION

The undersigned, Olaf Bexhoeft, hereby states that he is well acquainted with both the English and German languages and that the attached is a true translation to the best of his knowledge and ability of the German text of PCT/EP2005/006954, filed 06/18/2005, and published on 01/26/2006 as WO 2006/007913 A1.

The undersigned further declares that the above statement is true; and further, that this statement was made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any patent resulting therefrom.

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Bus Bar Support

The invention relates to a bus bar support, having a lower element, which can be mounted with its underside on a base, on whose top several bus bar receptacles have been cut, which are spaced apart form each other in the longitudinal direction and are designed for the insulated insertion of bus bars extending in the transverse direction, and a removable upper element, which closes the receptacles and fixes the inserted bus bars in place.

Such a bus bar support is represented in (non-published) DE 103 00 723 A1. With this known bus bar support of a bus bar system, several bus bars have been inserted in a customary manner into rectangular, open at the top, receptacles on a lower element, whose longitudinal direction is oriented transversely in respect to the bus bars, and are fixed in place therein by means of an upper element screwed to it. The underside of the lower element is mounted on a base. If it is necessary to fix bus bars of different width or thickness in this way, it is necessary to employ bus bar supports with appropriately matched bus bar receptacles.

The object of the invention is based on making available a bus bar support of the type mentioned at the outset, by means of which bus bars of different width and thickness can be solidly fixed in place.

This object is attained by means of the characteristics of claim 1. It is provided here that separate sliding elements are provided for blocking the bus bar receptacles in a direction of their thickness extending from the bottom to the top, and bearing inserts for blocking the bus bar receptacles in a direction extending transversely to the

longitudinal extension of inserted bus bars and in the longitudinal direction of the lower element, and that in its areas surrounding the bus bar receptacles, the bus bar support is provided with guide structures, in which the sliding elements and the bearing inserts are displaceably seated.

Variable matching of the bus bar receptacle to bus bars of different width and/or thickness is possible by means of the sliding elements and bearing inserts seated in this way, while providing solid fixation in place, wherein it is also possible to insert into the bus bar receptacles of the bus bar support, for example, bus bars which are of different width or thickness from one bus bar receptacle to the other bus bar receptacle of the same support.

Simple handling and adaptation to common bus bar cross sections is achieved in that the bus bar receptacles have a rectangular shape in longitudinal section of the lower element and are open toward the top, that in their blocking position the sliding elements rest on the underside of the bus bar receptacle and that in their blocking position the bearing inserts rest against a lateral face of the bus bar receptacle.

A simple embodiment which makes possible simple manipulation when matching the thickness consists in that the sliding elements are designed to be U-shaped and that the guide structures for the sliding elements are embodied as guide grooves, which extend from a lateral surface of the bus bar receptacle parallel with the base of the bus bar receptacle and in which the lateral legs are guided wherein, in the pushed-out position, the bottom of the U rests with its underside on the base of the bus bar receptacle.

Definite positions of the sliding element are obtained in that its resiliently designed lateral legs are provided on their inside with snap-in elements, and at least one snap-in counter element, which is matched to them, is embodied in the guide grooves and arranged in such a way that, in the completely inserted position of the sliding element and/or in the pulled-out position of the sliding element, the lateral legs are resiliently snapped in, and that, on the guide face of the bus bar receptacles adjoining the guide grooves, a transversely extending cutout which has been matched to the bottom of the U has been cut, into which the bottom of the U completely enters in the completely pushed-in state of the sliding element, so that the entire depth of the bus bar receptacle is usable. These measures also contribute to the captive seating of the sliding elements on the lower element, wherein it can be provided that, if required, the sliding elements can be completely removed over a detent in the groove by the exertion of additional force. With this embodiment it is also assured that in the completely pushed-in state of the sliding elements the sliding element receiver is available over its entire thickness.

A simple adaptation to different bus bar widths, along with a simple manipulation, is achieved by means of the steps wherein insert guides are formed below the bus bar receptacles between lateral outside wall areas of the lower element, in which bearing inserts are seated, displaceable to a limited extent in the direction of the normal line in respect to the bottom of the bus bar receptacle, wherein, in the completely lowered state, the bearing inserts reach with their tops at most as far as the bottom of the bus bar receptacle, and in their blocking position rest with their

backs on the lateral surface of the bus bar receptacle located opposite the sliding element, and the clear width of the bus bar receptacles is limited by a front of the bearing insert which is definitely distanced parallel from this lateral surface.

If it is provided that the fronts of the bearing inserts are embodied to be stepped, so that several front sections are formed, which definitely limit the bus bar receptacles in the broad direction as a function of the number of steps, i.e. the number of front sections formed by them, a corresponding multitude of adaptations to different bus bars widths results. In this way a match to a multitude of bus bars with different cross sections in the thickness and width directions results in combination with the separate sliding element.

Handling is furthermore made easier in that the bearing inserts are supported by means of a spring arrangement in the respective insert guides, and in the position of rest are pushed out into the bus bar receptacle as far as their push-in limit. In the course of inserting the bus bars, the bearing inserts are pushed in against the spring force if required, in order to insert a wider bus bar.

Here, an embodiment which is advantageous for the structure and the way of functioning consists in that the spring arrangement has a compression spring, which is supported on a support element which is releasably inserted in the area of the underside of the lower element. Moreover, those measures are advantageous for the production and the structure of the bus bar support, wherein on two oppositely located outer edges the support element is provided with fixation sections, which have been snapped into matched

fixation elements on the outside wall areas of the lower element.

The invention will be explained in greater detail in what follows by means of an exemplary embodiment, making reference to the drawings.

The drawing figure shows a bus bar support with a lower element 2, which can be mounted with its underside on a base and in whose top, which faces away from the underside, several, in this case three, bus bar receptacles 2.3 have been formed, in which bus bars, in particular of rectangular cross section, can be received, which are fixed in place by means of an upper element 1, which is to be screwed on or snapped on. For screwing, the upper element 1 has screw holes 1.1, which correspond to screw receivers 2.1 in the lower element 2.

The bus bar receptacles 2.3 can be varied in their thickness (depth) and their width extending in the longitudinal direction of the lower element 2 by means of inserted sliding elements 3 in order to provide an adaptation to bus bars of different width and/or thickness. For inserting the sliding element 3, guide grooves 2.2, which are U-shaped in cross section, have been cut parallel with the underside of the bus bar receptacle 2.3 on both outer sides of the lower element 2 into a lateral wall which delimits the bus bar receptacle 2.3 in the direction of its width, whose underside extends in the present case flush with the underside of the bus bar receptacle 2.3, and whose width is matched to the thickness of the sliding elements 3 extending in the direction of the depth of the bus bar receptacle 2.3, wherein the lateral legs 3.1 of the U-shaped sliding elements 3 are displaceably guided in the guide grooves 2.2. In the

end area located toward the bus bar receptacle 2.3 of the groove bottom of the guide grooves 2.2 and in their end area facing away from the bus bar receptacle 2.3, holding elements 2.21 in the form of recesses have been formed, into which snap-in protrusions 3.2 formed on the end areas of the insides of the lateral legs snap in by means of the spring effect of the lateral legs 3.1 when the respective sliding element 3 has been completely pushed in, or has been brought into the pulled-out position. Moreover, in the completely pushed-in position, the bottom of the U of the sliding element 3 rests completely in a recess 2.7 formed in the assigned lateral face of the bus bar receptacle 2.3 between the two respective guide grooves 2.2, so that the entire depth of the bus bar receptacle 2.3 is available without limitation. In the pulled-out state of the sliding elements 3 these rest with the underside of their lateral legs 2.1 and its bottom of the U on the underside of the bus bar receptacle 2.3, so that the bus bar receptacle 2.3 is accordingly limited in its depth and an inserted bus bar is solidly supported on the lower element 2. On their exterior, the lateral legs 3.1 have been provided with a non-skid structure, so that they can be easily adjusted. It is also advantageous that the sliding elements 3 are captively held in the guide grooves 2.2 of the lower element 2.

For varying the width of the bus bar receptacles 2.3, displaceable bearing inserts 4 are provided in the direction of thickness of the bus bar, or the direction of depth of the bus bar receptacle 2.3, which are displaceably seated in an insert guide 2.4 arranged between outside wall areas of the lower element 2. In their state in which they have been pushed out toward the top, in which they delimit the

respective bus bar receptacle 2.3 in the direction of width by means of their front side facing the receptacle, the bearing inserts 4 rest with their backs against the respective lateral face of the bus bar receptacle 2.3 which faces away from the sliding element 3, so that a solid support in the direction of width results. On their front facing the clear space of the bus bar receptacle 2.3, the bearing inserts have front sections formed by means of steps 4.1, which extend parallel in respect to the lateral surface of the bus bar receptacle 2.3. In this way, depending on the push-out distance of the bearing inserts 4 from the insert guide 2.4, different widths of the bus bar receptacle 2.3 are achieved, so that differently wide bus bars can be solidly fixed in place accordingly.

Toward the bottom, the bearing inserts 4 are supported by means of respective compression springs 5 on a support element 6, which has been fixed in place in the area of the underside of the lower element 2. The plate-shaped support element 6 has a holding peg 6.2, which is formed on its top and matched to the cylindrical spring 5 for inserting the spring 5. With its other end, the spring 5 is definitely maintained in the area of the underside, or inside, of the bearing insert 4 at a matched holding element. So that the bearing insert 4 is definitely guided in the direction of the thickness of the bus bar, guide grooves which extend in the thickness direction have been cut on both sides of it, which are engaged by guide elements 2.6 in the form of guide strips formed on the inside of the outside wall sections. In the completely pushed-in position, the bearing insert 4 protrudes with its top at most as far as the level of the underside of the bus bar receptacle 2.3. The pushed-out position of the

bearing insert 4 is delimited by means of a blocking element 4.3, which works together with a blocking element attached at a corresponding location of the lower element 2.

By means of fixation sections 6.1 in the shape of snap-in pegs and snap-in protrusions attached on the inside in the lower area of the outside wall sections to both sides of the support element 6, the latter has been solidly and releasably snapped into fixation elements 2.5 in the shape of snap-in recesses applied to the appropriate locations and for supporting the spring 5.

The sliding element 3 and the bearing inserts 4, which can be adjusted separately of the former, permit the matching of the bus bar receptacle 2.3 to bus bars of different thickness and different width in a simple way, wherein the adjustment elements in the form of the sliding elements and bearing inserts 4 are captively held in the lower element 2. For inserting a bus bar, first the sliding element 3 is placed into the pushed-in or pulled-out position corresponding to the thickness of the bus bar, whereafter the underside of the bus bar is introduced into the bus bar receptacle 2.3, wherein the one narrow longitudinal side is placed against the lateral surface of the bus bar receptacle facing the sliding element 3, so that the other narrow longitudinal side automatically finds the appropriate front section of the bearing insert 4 for blocking, and the bearing insert 4, if required, is then inserted accordingly far into the insert guide 2.4 against the spring force.

It is advantageous to match the bus bar receptacle 2.3, the slider 3 and the bearing inserts 4 in accordance with common cross-sectional dimensions of bus bars, for example 15x5 to 30x10 mm, in steps of 5 mm in thickness and width.

In this case bus bars with cross sections which differ from each other can then also be inserted into the different bus bar receptacles 2.3.